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## BOTANY.[1]

Popular Botany Again.—Some months ago, in commenting upon Step's "Plant Life," we referred to the duty which every scientific man owes to his country, to present the leading facts of his science in the language of the people.

We wish to reiterate the sentiment, feeling that in so doing we are aiding the cause of scientific and technical botany. We hold the more eminent a worker in science becomes, just so much the more is it his duty to appear before the world as an instructor who may speak "as one having authority." The world is full of men who write for the people, but who themselves have not seen the things whereof they speak. That they have readers, shows the longing there is among the people for a knowledge of scientific matters. Why should not every man who brings to light an important fact in any department of science, himself publish it to the world at large, instead of permitting another to do so "who has simply been standing at the door of the temple?"

The wonders of plant life ought to afford material for many a popular book, popular in the best sense of that much abused word. It is greatly to the credit of the people who read popular books, and who listen to popular lectures, that both authors and lecturers find it profitable to assume to have themselves seen the wonderful things of which they speak. There is a hint here for genuine workers, for the men who have all their lives been familiar with Nature's mysterious workings. If the man who makes a hasty excursion into the domain of Nature, and fills up his fragmentary and superficial observations by cramming from some standard volume, is so eagerly listened to, how much the more will he be who is able to draw from long years of personal experience the material of his narration.

Some time ago Miss Herrick prepared a few papers for *Scribner's Monthly* upon some of the curious and interesting things which the microscope had revealed to her in the world of plant life. She has now brought these together and added a few others under the title of "Wonders of Plant Life,"[2] which the Putnam's have brought out in one of the tastiest little volumes which it has been our good fortune to examine for many a day. We have first a chapter on the beginnings of life, in which many things as to protoplasm and plant cells are pleasantly spoken of; then follows a chapter on single-celled green plants, treating principally of diatoms, and a third on fungi and lichens, a fourth on liverworts and mosses, a fifth on ferns. The remaining chapters take up in order the physiology of plants, corn and its congeners, the microscope among the flowers, pitcher plants, and insectivorous plants.

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[1] Edited by Prof. C. E. Bessey, Ames, Iowa.

[2] The Wonders of Plant Life under the Microscope. By Sophie Bledsoe Herrick. New York, G. P. Putnam's Sons, 1883. 284 pp. 16 mo.

All the way through the author has introduced drawings from specimens of her own preparations, and these, with those copied from Sachs, Carpenter, Darwin and other sources, bring the number of illustrations up to eighty-five. Some of these are quite good, while others, we are sorry to say, are sadly deficient in that very desirable quality—accuracy.

Now this book is one from which, as a text, two separate sermons might be preached. From one standpoint it is to be commended, while from another it must be severely criticised. It is commendable in that the author has wrought into it so much of her own observation and work; it is to be criticised in that there are so many grievous errors which mar what would otherwise have been a delightful little book. We are sorry to have to say it, but there is not a chapter which does not contain erroneous statements. We are all the more sorry to have to say this, because of the evident good faith and desire on the part of the author to represent the several subjects treated of as they are understood by modern botanists. Had the manuscript (and some of the drawings) been submitted to some one more familiar with the subject, many of the errors might have easily been eliminated. For example, on page 73 we read "Mildew, which is so destructive to cotton and linen fabrics, etc., etc.," and we are then referred to "Fig. 20 A." Upon turning to the figure we find a poorly copied drawing of wheat rust (Puccinia)! The blunder, for such it is, comes from the fact that in England wheat rust is called mildew, but our author ought to have known that what she referred to is a very different thing. On page 133 we have an illustration of the truth of the adage "that a little knowledge is a dangerous thing." Here we read that "lateral shoots, vegetable hairs, and leaves are exogenous, or proceed from a layer of growing cells just underneath the bark," a statement which bears evidence of an entire misunderstanding of the term exogenous in this connection. It is needless to cite further examples. May we not hope that the publishers will authorize an early revision, in which the errors will be eliminated?

GENERA PYRENOMYCETUM SCHEMATICE DELINEATA. By P. A. Saccardo, Patavii, Nov. 1883.—This latest work of the well-known mycologist of Padua, consists of fourteen lithographic plates, large 8vo, on which are illustrated the 280 genera into which the Pyrenomycetes are divided, according to the system of classification adopted in the two volumes of the Sylloge by the same author. The figures, though not claiming artistic perfection, are very good and answer admirably the purpose for which they were intended. They give in fact "a bird's eye view" of this vast family of fungi and may be considered as indispensable both to the amateur and the critical student of mycology. It is noticeable that in this new arrangement, the name Sphæria, under which all these forms were once included, has, as far as any generic significance is concerned, entirely disappeared, being retained only to designate the 420 species (enumerated on pp. 367–543, *Syll.*, vol. 2) whose fructification is unknown. Whether this new classification, founded principally on the color and septation of the sporidia, will finally be accepted, remains to be seen. By the mycologists of continental Europe it is already adopted, while the English mycologists, under the leadership of Dr. Cooke, are raising some objections which are worthy of consideration.

The old classification of the Sphæriaceæ has already been essentially modified and is destined yet to undergo still further changes. The only question seems to be concerning the nature and extent of these changes.

In making innovations on any old and well established system, the tendency is always to extremes, and the new definitions proposed are finally accepted, rejected or modified in accordance with the conclusions deduced from more mature deliberation, and this no doubt will be the case with the new carpological system so ably advocated and finely illustrated by the learned editor of the *Sylloge.*

The objections urged against this system are, in brief, that forms evidently closely allied are widely separated. For example, the old genus Melanconis is limited to the species with uniseptate hyaline sporidia and stands in the sect. Hyalodidymæ, while the species with uniseptate brown sporidia constitute the genus Melanconiella in the sect. Phæodidymæ, and the species with brown sporidia having three or more septa are placed in the genus Pseudovalsa in the sect. Phæophragmiæ, the mode of growth in all these three forms being essentially the same, *i. e.*, perithecia more or less distinctly circinate in a definite stroma. It cannot be denied that the carpological system of classification has merits not to be disregarded or hastily rejected, and it is probable that with some modification it will yet be universally adopted. Meanwhile, whatever may be the final conclusion, students of mycology everywhere will be glad that with the two volumes of the *Sylloge* and the " Genera Pyrenomycetum " they may now with reasonable certainty determine the various species of Sphæriaceous fungi within their reach.—*J. B. Ellis, Newfield, N. J., Dec. 10, 1883.*

New Florida Fungi, III.—*Isariopsis clavata*, E. & M.—Bundles of fertile hyphæ about $5^{mm}$ high and 30–40$\mu$. thick, composed of loosely compacted threads divergent and subundulate above and bearing at their tips single oblong-fusiform brown 3-septate conidia, 18–22 $\times$ 5–6 $\mu$. Many of the component threads terminate in free, divergent ends, these free ends also bearing conidia. There is also a prostrate hypha, like that of Meliola, forming orbicular patches from which the upright hyphæ arise. On living leaves of *Persea palustris.*

The above described species were collected at Green Cove Springs, Florida, during the winter of 1882–3, by Dr. Martin.

To these may be added the following species collected at various places:

*Phyllosticta fraxini* E. & M.—Spots light brown with a dark purple border, ½–$1^{\mathrm{cm}}$ in diam., perithecia epiphyllous, scattered, lentiform, black, (150μ); spores oblong, or oblong-elliptical, hyaline, 1–2 nucleate, 7–9 × 2½–3μ. On leaves of Fraxinus, Del. Co. Pa. Dr. Martin; and Bethlehem, Pa., E. A. Rau.

*Phyllosticta catalpæ* E. & M.—Spots pale brown, circular, $5–7^{\mathrm{mm}}$ diam., border darker; perithecia few scattered, often sterile, brown, lenticular, innate, epiphyllous, 112 × 84μ; spores subhyaline, oval, 5–7 × 2½–4½μ. On leaves of *Catalpa bignonioides.* West Chester, Pa., August, 1883.

*Ramularia orontii,* E. & M.—Spots large, pale brown, border darker; hyphæ epiphyllous, hyaline, 30 × 3μ, apices mostly bifid; conidia hyaline, numerous, oblong, with the ends rather acute, uniseptate, 18 × 4μ. On leaves of Orontium. Newfield, N. J.

*Ramularia andromedæ* E. & M.—Hypophyllous, forming dull white orbicular patches about $1^{\mathrm{cm}}$ diam., with a red-brown spot of the same extent on the opposite side of the leaf; hyphæ, simple or branched, continuous, 30–40 × 3μ; conidia oblong or cylindrical, 10–20 × 1½-2μ, continuous or uniseptate. On leaves of *A. racemosa.* Newfield, N. J.

*Cercospora perseæ,* E. & M.—On reddish-brown irregular-shaped spots ¼–$1^{\mathrm{cm}}$ diameter, with a dark but not raised border; hyphæ epiphyllous, densely cæspitose, brown, faintly septate, bent and geniculate above, apices subdenticulate, 55 × 4μ. Conidia slender clavate, 3–4 septate, 100 × 3μ. On leaves of *Persea palustris.*

*Cercospora heucheræ* E. & M.—Spots brown, mostly round ($4–5^{\mathrm{mm}}$), border obsolete; hyphæ fasciculate, flexuous, light brown, mostly hypophyllous, 30 × 3–4½μ; conidia subhyaline (light straw color), cylindric-clavate, septate, 60–75 × 3μ. On leaves of *Heuchera americana.* Chester Co., Pa.

*Macrosporium Martindalei* E. & M.—Hypophyllous on pale round spots, ½–$\frac{3}{4}^{\mathrm{cm}}$ diam. on living leaves of *Magnolia glauca.* Hyphæ erumpent, cæspitose, geniculate, multiseptate, 50–80 × 5 ; conidia 35–50 × 18–22μ, about 3-septate at first, becoming muriform and dark brown; pedicels 20–50μ long, often wanting. The hyphæ form tufts nearly black, arranged in a circle about $3^{\mathrm{mm}}$ in diameter. Occasionally the fungus appears on the upper side of the leaf. The spots on the upper side of the leaf are much darker with a more distinct border and show a dark discolored speck in the center, in which is often found a small white larva about ⅛ of an inch long, apparently hatched from an egg deposited by some insect, which thus causes the dead spot in the leaf on which the fungus grows. This curious species was discovered by Mr. Isaac C. Martindale, while on a visit to Newfield, Sept. 23d, 1883.—*J. B. Ellis, Newfield, N. J., and Dr. Geo. Martin.*

LABORATORY HELPS.—About two years ago the German edition of Poulson's little manual, *Botanische Mikrschemie*, made its appearance in this country, and was at once placed upon the list of necessaries in the botanical laboratory. Professor Trelease has rendered an excellent service to botanists by translating the work, adding somewhat to it, and causing it to be published in this country. It appears under the title of Botanical Microchemistry, and is published by the well-known Boston house of Cassino & Co. The scope of the work may be understood from the principal topics noted in the table of contents, viz: Microchemical reagents and their application; mounting media and cements; vegetable substances and the means of recognizing them. It is in substance just the book that every laboratory student has been wanting to have at hand for a long time. We regret that the publishers did not print it upon thinner paper. As it is it will be necessary to break the binding before the book will remain open upon the laboratory table. It should have been printed upon thin paper, with narrow margin and a flexible binding, and we hope that the author, and the many students who will use the work, will make so strong a demand upon the publishers as to compel them to speedily bring out a new edition in the more desirable form.

A NEW EDITION OF COOKE'S HAND-BOOK OF THE BRITISH FUNGI.—It is with a great deal of pleasure that we welcome the first installment of the new edition of this valuable work. The first edition which was published in 1871, has long been familiar to all students of the fungi, and while it contains much that is antiquated, it still is the only general work available. The Hymenomycetes of the new edition will appear as an appendix to *Grevillea*, so paged as to be bound separately upon its completion.

BOTANICAL NOTES.—*Grevillea* for December contains an instructive paper on alkaloids and other substances that have been extracted from Fungi, prepared by C. G. Stewart of St. Thomas's Hospital Chemical Laboratory. We hope to present extracts from this paper at an early day for readers of the NATURALIST. ——Another species of Podophyllum (the genus of our common may apple) has just been described by Dr. Hance, in the *Journal of Botany*. It was discovered in the Lo-fau-shau mountains of the province of Canton, China. It has four to five extra-axillary purple isostemonous flowers, and has been named *P. versipelle*. This makes four species of the genus now known, viz: *P. peltatum* of eastern North America; *P. emodi* of the Himalayan region; *P. pleianthum* of Formosa, and *P. versipelle* of south-eastern China. ——It is with great pleasure that we read the announcement of the editor that the *Journal of Botany* will be continued, the support during the past year having been sufficient to leave a balance on the right side of the account.——In the October number of the *Torrey Bulletin*, Dr. Allen publishes some very interesting notes on the American species of Fortpella, with six plates of figures. A key to all the known species (12) is given, and four new species and a new variety are described. Eight species are found in North America, and these are widely enough distributed to warrant a search for them in any part of the country with a reasonable hope of success.——In the same number D. H. Campbell figures and describes some very simple prothallia of a fern (*Onoclea struthiopteris*). A row of four or five cells terminate in an apparently single celled antheridium! They were obtained by artificial culture under glass.——Robert Ridgway, in the December *Botanical Gazette* records a number of true measurements, which confirm the belief we have held for many years that the heights of our trees as given in the books and manuals are uniformly too low; witness the following: *Quercus michauxii*, 119 feet; *Carya porcina*, 115 feet; *C. microcarpa*, 134 feet; *Catalpa speciosa*, 101½ feet; *Fraxinus americana*, 127 feet; *Sassafras officinale*, 82 feet.——After a long delay, no doubt very vexatious to the author, the botanical portion of the thirty-third and thirty-fourth Annual Reports of the New York State Museum of Natural History have appeared. The first was transmitted to the legislature in February, 1880, and the last in March, 1881. Surely the State of New York ought not to delay so inexcusably the publication of such important reports. Both contain numerous descriptions of new species, and in each are good plates giving details of structure.

## ENTOMOLOGY.[1]

FLIGHT OF INSECTS.—Dr. Amans in his extended paper describes his examination of the structure of the thorax in Æschna, Sirex and Locusta, and discusses the views of previous authors on the subject of flight of insects. He considers that a rational theory of flight can only be formulated after various dissections and numerous experiments on the resistance of the air; the laws of the latter are as yet very incompletely known, and as to anatomy, a knowledge of one animal hardly affords a sufficient basis for a general theory. For the investigation of preliminary problems Æschna is specially well adapted, as it is probably the most swiftly flying of insects, making, as it does, twenty-eight vibrations a second.

ANTENNARY RODS OF VANESSA IO.—J. Chatin describes the cavities found on the joints which form the tip of the antennæ of

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[1] This department is edited by PROF. C. V. RILEY, Washington, D. C., to whom communications, books for notice, etc., should be sent.